Space Weather Forecast

Issued on Tuesday, 07 November 2023 at 12:44 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Geomagnetic Storms Day 1 (07 Nov), risk then declining. Slight Chance of Moderate-class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with only Common-class flares observed in the last 24 hours. The two largest regions on the visible disc are both in the southern hemisphere, but neither is showing any significant magnetic complexity. The remaining two numbered and one un-numbered regions on the disc are small and simple at present.

No Earth directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds showed the onset of a coronal hole fast wind. Wind speeds were initially elevated or slightly elevated, around 450-550 km/s, but increased to become strong above 600 km/s after 06/1200 UTC. Total magnetic field strength was occasionally moderate at first, but soon eased to become weak. The north-south component varied moderately initially, but is now varying only weakly. Geomagnetic activity has been Quiet to Active (Kp 2-4), but with a couple of G1/Minor Storm (Kp 5) intervals 06/1800-2100UTC and 07/0000-0300UTC, as observed by BGS.

UK Aurora Analysis: Aurora was observed overhead across Scotland, Northern Ireland, Wales and much of northern and central England overnight 05 into 06 Nov. Aurora was also visible towards the northern horizon further south with sightings for much of southern England. Aurora sightings have since been declining.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is expected through the next four days, with a slight chance of isolated Moderate-class flares, mainly from the two larger regions in the southern hemisphere.

Solar Wind / Geomagnetic Activity: No further CMEs are currently forecast to reach Earth. Solar wind speeds are at strong levels, above 600 km/s, due to a coronal hole fast wind. Strong wind speeds are likely to continue through Day 1 into Day 2 (07-08 Nov), before a gradual decline through Days 3 and 4 (09-10 Nov).

Geomagnetic activity is likely to be Quiet to Active, with a chance of isolated G1/Minor Storm intervals on Day 1. Activity is expected to gradually decline through the following days as the fast wind eases.

UK Aurora Forecast: Aurora is only likely to be visible for parts of northern Scotland on Day 1,

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declining for subsequent days.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	50	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	20	20	20
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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